E. St. Louis / Milam (SCA)
Ground water

WARZYN

Report
C600180

Comprehensive Remedial Action And Removal Plan Milam Sanitary Landfill St. Clair County, Illinois

Prepared for:

**Midwest Region
Waste Management
Of North America, Inc.
East St. Louis, Illinois**

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SECTION 2 - GENERAL SITE INFORMATION

A. Site Location and Description

The Waste Management of Illinois, Inc., Milam Sanitary Landfill is located in St. Clair County, Illinois (Section 5, T2N,R9W, Canteen Township), approximately 2.6 miles east of the Mississippi River and one mile north of East St. Louis as shown in Drawing C 600180-B1. It is located within the river valley, in a physiographic province called the American Bottoms. The surficical geologic materials are characteristic of fluvial and floodplain alluvium. However, because of the flood control devices which have been constructed along the Mississippi River, the site is not located within a present day floodplain. The original local topography of the region is flat, with original elevations varying from 405 to 410 feet (MSL).

Two separate mounds comprise the Milam Sanitary Landfill. The previously operated "Old Milam" is located on the western half of the property, and the currently operated "New Milam" is located on the eastern half as shown on Drawing C 600180-B2. The two landfills are separated by Old Cahokia Creek. Old Milam was completed to a maximum elevation of approximately 440 feet. The final grade has little or no slope on the top with numerous shallow depressions and closed drainage areas. New Milam is being constructed with contours to reach a maximum elevation of approximately 480 feet and slopes designed to promote runoff.

B. Geology and Hydrogeology

Detailed descriptions of the regional geologic setting and local geologic characteristics have been previously submitted and can be found in appendices to the CAP; including:

GeoEngineering, Inc., 1986. Contamination Assessment Plan, Milam Sanitary Landfill, Narrative and Appendices in 3 volumes.

Layne-Western Co., Inc., 1973. Results of Subsurface Investigation, Milam Landfill site.

Andrews, J.D., 1980. Report on Ground and Surface Water Conditions at The SCA-Milam Landfill.

Johnson, T.M., 1981, Report to IEPA.

A summary of essential hydrogeologic site characteristics and site history details follows.

1. Hydrostratigraphy

The bedrock, located approximately 120 feet below land surface at the Milam Sanitary Landfill, is Mississippian and Pennsylvanian aged limestone and dolomite (Emmons, 1979). It is covered by 95 to 105 feet of sand and gravel deposits, which, in turn, are covered by 5 to 25 feet of fine-grained alluvium. The sand and gravel deposits directly overlying the bedrock are coarse grained glacial valley-train deposits. The sands and gravels which overlie the valley train have been deposited by the meandering channel of the Mississippi River. Characteristic of fluvial deposition, the grain size decreases upward.

The 100-foot thick sand and gravel unit is the major groundwater producing aquifer in the area. At the Milam site it exists primarily as a leaky confined aquifer beneath the fine-grained (clayey) upper alluvium. The uppermost granular river deposited material is a brown to gray fine sand found in thicknesses from 2 to 25, feet beneath the original ground surface.

This sand is overlain by a 2 to 25 foot thick layer of gray to dark gray clay, classified at the surface as the Karnak Soil by the Department of Agriculture (Wallace, 1978). The occasional organic layers and layers containing shell fragments indicate a lacustrine depositional environment. The clay layer forms a natural liner beneath the Milam landfills. It is generally thickest to the northeast, thinning to the south and west. Borings tabulated in Table 1 show the variable clay thickness across the site. The boring locations are shown on Drawing C 600180-B2. The clay liner is 9 to 15 feet thick beneath New Milam, and is generally 5 to 8 feet thick beneath Old Milam. Individual boring logs (Borings B-1, B-5, GEI-2, GEI-17, GEI-16) along the western and southern boundary of Old Milam indicate that the clay layer is thin or absent at several locations. Previous reports have discussed the possible causes for the observed thin clay in these areas. Possible causes are the depositional environment and that the clay was excavated for daily cover.

TABLE 1

SUMMARY OF CLAY AND SILT THICKNESSES AT MILAM BORINGS

Well or Boring Number	Approx. Surface Elevation	Approx. Base of Refuse	Approx. Bottom of Clay	Approx. Thickness of Unit (feet)		
				Refuse	Clay	Silt
GEI-1	411.0	401.0	387.0	10	6.5	3.0
GEI-2	409.0	400.0	395.5	9	1.0	#
GEI-3	405.0	402.0	390.0	3	12.0	#
GEI-4	415.5	413.0	398.0	12	8.0	#
GEI-5	406.5	--	391.0	0	15.0	#
GEI-6	410.0	403.0	391.5	7	11.5	#
GEI-7	404.0	--	395.0	0	9.0	#
GEI-8	407.0	--	395.0	0	12.0	#
GEI-9	404.5	--	382.0	0	22.5	#
GEI-10	402.5	--	384.0	0	18.5	#
GEI-11	401.5	--	381.5	0	20.0	#
GEI-12	405.0	--	394.5	0	15.5	#
GEI-13	410.5	395.5	390.0	15	5.0	1.5
GEI-14	415.0	402.0	395.0	13	2.0	4.5
GEI-15	406.0	401.0	397.0	5	1.5	2.5
GEI-16	403.5	394.5	394.5	9	0.0	#
GEI-17	412.5	405.0	394.0	7.5	0.0	7.0
B-1	407.6	400.0	400.0	0.0	0.0	#
B-2	416.6	403.6	389.6	0.0	14.0	#
B-3	312.4	398.4	391.4	0.0	7.0	#
B-4	414.1	400.0	392.1	--	9.0	
B-5	411.8	410.8	400.1	--	0.0	8.0
B-6	405.3	**	403.0	**	1.5	5.0
B-7	407.7	**	--	**	0.0	2.5
B-8*	422.0	397.5	388.0	--	9.0	#
B-9	414.3	399.3	393.3	--	6.0	#
B-10	410.5	407.5	384.5	--	23.0	#
B-11	409.8	405.3	392.3	4.5	13.0	#
B-12	413.5	400.5	393.5	--	7.0	
B-13	414.4	402.4	400.5	--	8.0	3.5
B-14	405.5	**	--	**	0.0	5.0
B-15	405.5	**	396.0	**	1.0	6.0
B-16	406.3	**	397.3	**	0.0	9.0
B-17	410.6	402.6	394.6	+	8.0	#
B-18	407.1	406.0	393.6	**	13.5	#
B-19	404.0	403.0	391.5	+	12.5	#
B-20	407.0	**	383.0	**	15.0	#
B-21	402.0	+	387.5	+	14.5	#
B-22	404.3	+	393.3	+	11.0	#
B-23	402.5	**	400.0	**	2.5	#
B-24	404.5	**	394.5	**	10.0	#
B-25	405.4	+	389.4	+	16.0	#
B-26	401.4	+	384.4	+	17.0	#
B-27	405.1	**	382.1	**	17.0	#
B-28	402.9	**	391.0	**	11.0	#
B-29	402.5	**	387.5	**	17.0	#
B-30	407.2	**	384.2	**	23.0	#

* = Surface Elevation Modified from Boring Log
-- = Does Not Apply
** = No Filling Has Occurred Since Boring Was Performed
\+ = Filling Has Occurred Since Boring was Performed
\# = None Measured

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Drawings C 600180-B4 and -B5 present cross sections that show the clay liner thicknesses beneath the Old and New Milam landfills. The traverses were selected to include the 1973 Layne-Western borings and more recent monitoring well borings (see locations on Drawing C 600180-B3). Cross Section A-A (Drawing C 600180-B4) traverses both the Old and New Milam sites from west (GEI-13) to east (GEI-10). Cross Section B-B (Drawing C 600180-B5) cuts from south to north through the center of Old Milam, and Cross Section C-C (Drawing C 600180-B5) cuts from southwest to northeast through New Milam. It can be seen that the clay layer is thickest to the north and east, thinning southward and westward. Further thinning from excavation is apparant at the south side of Old Milam.

2. Regional Water Quality

The U.S. Army Corps of Engineers and the U.S. Geological Survey conducted a study of the groundwater quality in the American Bottoms, the region which includes the East St. Louis and Milam area (Voelker, 1984). Samples were collected from 63 wells, most completed to depths greater than 100 feet. It was found that water quality was generally within the Illinois water quality standards. However Illinois public water supply, effluent, and general water quality standards were exceeded by iron, manganese, and total dissolved solids in 79, 92, and 67 percent,of the samples, respectively.

C. History of Site Operation

Refuse disposal activities were initiated in the 1960s, as explained in the CAP. An operational permit was granted for Old Milam in 1974, and the site was operated until November 1976. A new permit for the operation of New Milam was granted in 1978, and a permit for disposal of special wastes was also issued in 1978. All drums buried in the special waste area were exhumed and removed from the site by November 1984; all contaminated soil was removed by May 1986.

GeoEngineering (1986) evaluated the excavation and filling history of Old Milam by analyzing stereo pairs of aerial photographs taken between 1967 and 1977. Topographic maps were made from 5 sets of these photos. Based on interpretation of these photos, GeoEngineering concluded that the clay was

excavated to near potentiometric surface levels in several areas along the western part of the Old Milam Landfill. GeoEngineering inferred that the clay confining layer was not breached over any large area from the lack of evidence of water infilling.

There are two french drain leachate collection systems in place at the Milam Landfill as shown on Drawing C 600180-B2. The existing systems are located along the northern side of Old Milam and along the eastern side of the access road into New Milam. These measures were installed in recent years to address leachate seeps identified in those areas. Since these measures have been implemented, no significant seeps have been noted in those areas.

There is a french drain leachate collection system proposed for the area currently occupied by Old Cahokia Creek. Waste Management of Illinois, Inc. submitted a proposed plan to IEPA on December 10, 1985 to relocate Old Cahokia Creek east of the New Milam Landfill (as shown on Drawing C 600180-B13). A revised plan was submitted on September 8, 1986 that called for the relocation of the Creek and the installation of a drain system (as shown on Drawing C 600180-B13) to address the leachate seeps from both the Old and New Milam landfills in the Creek area. The creek relocation efforts will eliminate the discharge of leachate into Old Cahokia Creek.